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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/029,877	12/31/2001	Richard Corpuz Simeon	56162.000310	4010

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EXAMINER	
LU, JIA	

ART UNIT	PAPER NUMBER
2634	

DATE MAILED: 04/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/029,877	SIMEON ET AL.	
	Examiner	Art Unit	
	Jia W. Lu	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 December 2001*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-28* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-28* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 4/1/02
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

2. Claims 1, 2, 7-11, 16-20, 25-28 are rejected under 35 U.S.C. 102(e) as being unpatentable over US Patent 6,370,244.

   a. Regarding claims 1, 10, 16 and 25, patent '244 shows a system for detecting a tone presence within a signal, using Fourier Transform means for performing a Fourier Transform on an incoming signal, where the Fourier Transform generates a frequency spectrum for the incoming signal (column 3, lines 12-15), and normalizing means for producing a normalized frequency spectrum (column 9, lines 42-45). The integrator means for generating the means of the normalized frequency is disclosed in column 10 lines 49-65: notice that $(H_{p1}+H_{p2})/2$ is the mean value of DTMF power. Patent '244 also describes comparator means for determining whether a function that is directly dependent on a mean of values from the normalized frequency spectrum i(column 10, lines 49-53)

exceeds a predetermined threshold value (column 10, lines 55-60). If said value exceeds the threshold, a decision is made that a tone is detected. It is implicit that the comparator generates a distinct signal to the system communicating whether or not a tone is detected.

b. Claims 2 and 11 inherit the limitations of claim 1; further, patent '244 discloses a codec for receiving an analog signal and converting it to a digital signal (column 2, lines 33-44) and digital signal processor that includes circuitry comprising functions described above (abstract, lines 21-22).

c. Regarding claim 20, patent '244 describes the use of a digital signal processor (see abstract, lines 21-22) to include all limitations of present claim 1 and a computer device to calculate various items in determining the threshold as described above (column 10, line 1), and it is implicit that a computer readable storage medium is used to store those limitations.

d. Claims 7, 17 and 26 inherit the limitations of claim 1; Further, patent '244 discloses using Discrete Fourier Transform in its Fourier Transform (column 3, lines 23-24).

e. Claims 8, 18 and 27 inherit the limitations of claim 1; Further, patent '244 discloses using Fast Fourier Transform in its Fourier Transform (column 3, lines 12-13).

f. Claims 9, 19 and 28 inherit the limitations of claim 1; Further, patent '244 discloses using Goertzel Transform in its Fourier Transform (column 3, lines 23-24).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 5, 14 and 23 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,370,244 as applied to claims 1, 10 and 20 above, and further in view of US Patent 6,505,223. Claim 5, 14 and 23 inherit the limitations of claims 1, 10 and 20 above. Patent '244 does not describe a frequency spectrum for a real and imaginary component, or its normalization by multiplying an inverted magnitude. However, patent '223 shows the normalization of real and imaginary Fourier coefficients by dividing each component by a magnitude (column 1, lines 63-65). It would have been obvious to one ordinarily skilled in the art to normalize a frequency spectrum by magnitude in a detection system to increase reliability of detection, and greatly reduce the number of calculations.

5. Claims 3, 4, 12, 13, 21 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,370,244 as applied to claims 1, 10 and 20 above, and further in view of US Patent 6,466,958.

a. Claims 3, 12, and 21 inherit the limitations of claims 1, 10 and 20 above. Patent '244 does not describe the use of a single frequency bin to correlate with the tone being detected. Patent 958 describes the detection and correlation of multiple frequencies with specific discrete frequency bins (column 7, lines 7-10). It would have been obvious to one ordinarily skilled in the art to use a single bin to relate to a single frequency in a tone detection system as described in '244, when there is only one frequency being detected, to save unnecessary computations.

b. Claims 4, 13 and 22 inherit the limitations of claims 1, 10 and 20 above. Patent '244 does not explicitly describe the expression $A_n(k)*e^{j*\Theta n(k)}$ to represent the tone and noise portions of the incoming signal for the frequency bin. However, the expression $Ae^{j*\Theta}$ is well known in the art to be present in a Fourier Transform. Patent '958 shows an example of this expression $S(nT)*e^{j*w(nT)}$ (column 10, lines 30-35), where "nT" is the bin number, S is the amplitude of the frequency portion, and w is the phase angle. Because tone and noise are of similar frequency expressions after a Fourier Transform, it would have been obvious to one ordinarily skilled in the art to use it to express both frequency desired and frequency undesired in order to standardize and simplify calculations.

6. Claims 6, 15, and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent 6,370,244 as applied to claims 1, 10 and 20 above, and further in view of IEEE publication "A digital Receiver for Dual Tone Multifrequency (DTMF)

signals", by Ali M. Shatnawi, published in May 1997. Claims 6, 15, and 24 inherit the limitations of claims 1, 10 and 20 above, however, patent '244 does not show the predetermined threshold value to be 0.5. In his publication, Shatnawi shows this value to be 0.5 (page 1000, equation 9). It would have been obvious for one ordinarily skilled in the art to use this value in order to incorporate an average of the attenuations of different high and low filters used in comparison in order to yield a reasonable result.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jia W. Lu whose telephone number is 571-272-6042. The examiner can normally be reached on Mon- Fri, 9:30AM-5:30PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stephen Chin can be reached on (571)272-3056. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Jia Lu
Examiner

STEPHEN CHIN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2600